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U. S. DEPARTMENT OF
AGRICULTURE

FARMERS' BULLETIN No. 1604

DAIRY-HERD-
IMPROVEMENT
ASSOCIATIONS

AND STORIES
THE RECORDS
TELL



FIRST-CLASS, profitable dairy farms are almost always found in groups. The center of each group is some farm, some man, some idea.

The 1,090 dairy-herd-improvement associations now active in the United States represent that many groups of improved dairy farms.

In nearly every case the association depends upon the activity of a few progressive farmers and centers around the idea that every dairyman should know the individual records of his cows. He needs to know what each cow is producing if he is to manage and develop his herd profitably. This knowledge can be obtained through dairy-herd-improvement association records.

The purpose of this bulletin is to show the need and value of dairy-herd-improvement associations, to present briefly some of the outstanding results obtained from a tabulation of association data, and to show how such associations may be organized and conducted.

This bulletin is a revision of and supersedes Farmers' Bulletin 1446 entitled "Cow-Testing Associations and Stories their Records Tell."

DAIRY-HERD-IMPROVEMENT ASSOCIATIONS, AND STORIES THE RECORDS TELL

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CONTENTS

	Page		Page
Methods of work-----	1	How to start and conduct an asso-	
Increase in number of dairy-herd-		ciation-----	15
improvement associations-----	3	Production and income-----	18
Results of dairy-herd-improvement		Constitution and by-laws for the	
associations-----	4	dairy-herd-improvement associa-	
How farmers regard the work-----	7	tion-----	19
What dairy-herd-improvement asso-			
ciation records reveal-----	10		

LIKE A SEARCHLIGHT, the dairy-herd-improvement association pierces the dense darkness that prevails so generally regarding the records of our dairy cows. In this penetrating and revealing light, production and feed-cost records stand out clearly. Only the scrub cow whose milk or butterfat production is scant need fear the light. Well may that cow dread the truth as told by the milk scales and the Babcock test, because when her record becomes known her doom is sealed and she must depart forever from the herd.

Far different is the fate of the large producer. She has no cause to fear the light. Through the work of the dairy-herd-improvement association her high record stands out as it actually is, her true value becomes known, and in the dairy herd she takes her proper place. From that time on, if she is fed according to production, she will produce milk abundantly. As the years roll around she may become the mother of a strain of high producers and persistent milkers, and unlike her distant relative, the scrub, she may remain for many years an honored member of the dairy herd—honored because profitable.

METHODS OF WORK

As ordinarily conducted in this country, a dairy-herd-improvement association is an organization of about 26 dairy farmers, who cooperatively employ a tester to keep production, feed, and income records of their dairy cows.¹ Knowing the actual records of his cows, the dairyman can with certainty eliminate those that are unprofitable and feed the remainder according to known production.

¹ The following publication, giving details regarding the tester's work, may be obtained on application to the department: McDOWELL, J. C. THE COW TESTER'S HANDBOOK. U. S. Dept. Agr. Misc. Circ. 26, 24 p., illus. 1927.

The most useful dairy-herd-improvement association also compares the records of dams and daughters, promotes the use and ownership of better sires, especially good proved sires, and shows the advantage of feeding satisfactory rations. This is a big program, but it is not too big for the well-organized and well-managed association.

ACCURACY OF DAIRY-HERD-IMPROVEMENT ASSOCIATION METHOD

In the dairy-herd-improvement association work the milk is ordinarily weighed and tested one day each month, and the monthly production is determined by multiplying the daily production by the number of days in the testing period. (Fig. 1.)

To determine the accuracy of this method of calculating production, the United States Department of Agriculture has compared results of this method with a large number of yearly individual-

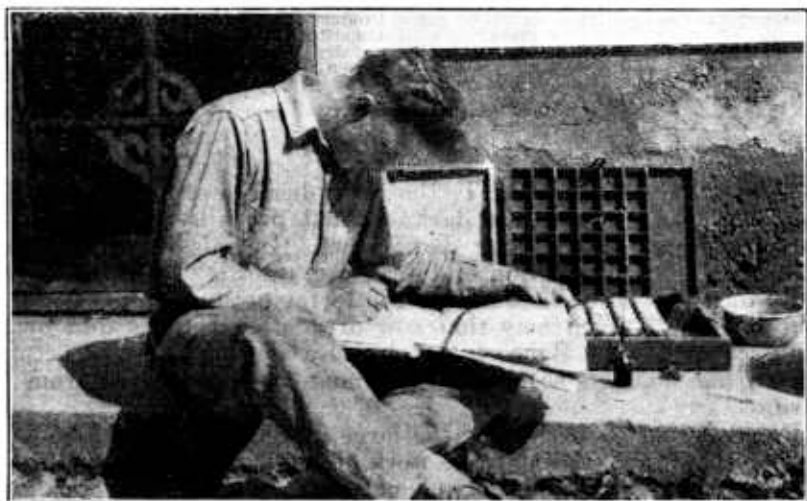


FIGURE 1.—The milk is tested once a month and the results recorded

cow records of the Minnesota Experiment Station which gave the production of milk and butterfat for each milking throughout the year. By systematically picking out the weights and tests for one day each month, as they would have been obtained by the association method, and thus calculating the yearly production, it was found that the association method was accurate within 2 per cent on milk production and within 3 per cent on production of butterfat.

A tabulation has also been made of a large number of yearly individual-cow records from the Bureau of Dairy Industry experimental farm at Beltsville, Md. These records gave the milk production night and morning for every day in the year. A yearly total calculated from one day's record each month, when compared with the actual milk production, showed an accuracy within 1.99 per cent. These comparisons indicate that the method used in association work gives a reasonably accurate record of production.

INCREASE IN NUMBER OF DAIRY-HERD-IMPROVEMENT ASSOCIATIONS

The first dairy-herd-improvement association in the United States was organized in Newaygo County, Mich., in 1905, and the testing work was begun in January, 1906. Since then, with the exception of the two years, 1918 and 1921, there has been a rapid and fairly constant growth in the number of associations. Table 1 shows the number of associations on July 1 of each year from 1906 to 1923, inclu-

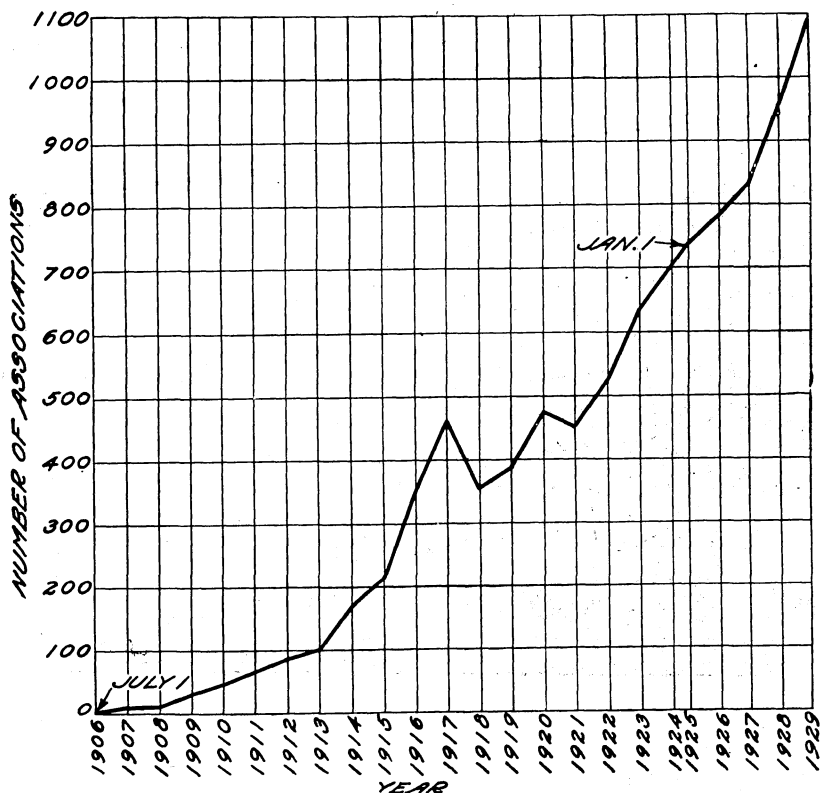


FIGURE 2.—How dairy-herd-improvement associations have grown in numbers year by year

sive, and on January 1 of each year since 1925. Figure 2 shows graphically how the number of these associations has increased during these years.

TABLE 1.—Number of dairy-herd-improvement associations, 1906 to 1929, inclusive

Year	Associa- tions	Year	Associa- tions	Year	Associa- tions
1906.....	1	1914.....	163	1922.....	513
1907.....	4	1915.....	211	1923.....	627
1908.....	6	1916.....	346	1925.....	732
1909.....	25	1917.....	459	1926.....	777
1910.....	40	1918.....	353	1927.....	837
1911.....	64	1919.....	385	1928.....	947
1912.....	82	1920.....	468	1929.....	1,090
1913.....	100	1921.....	452		

The decline in this work in 1918 and again in 1921 was due largely to a shortage of trained testers. The number of associations in active operation January 1, 1929, was 143 more than on January 1, 1928. Figure 3 shows the distribution of the associations on January 1, 1929.

On January 1, 1929, there were 1,090 associations with 26,182 members and 465,804 cows on test. As there are approximately 21,948,000 dairy cows on farms in the United States, the number of cows now on test in dairy-herd-improvement associations is approximately 2.1 per cent of the total.

But what of the 97.9 per cent whose records are unknown? Many men who do not know what each of his dairy cows is producing from a dollar's worth of feed are conducting an unprofitable business. A man's progress in the dairy business is usually in direct propor-

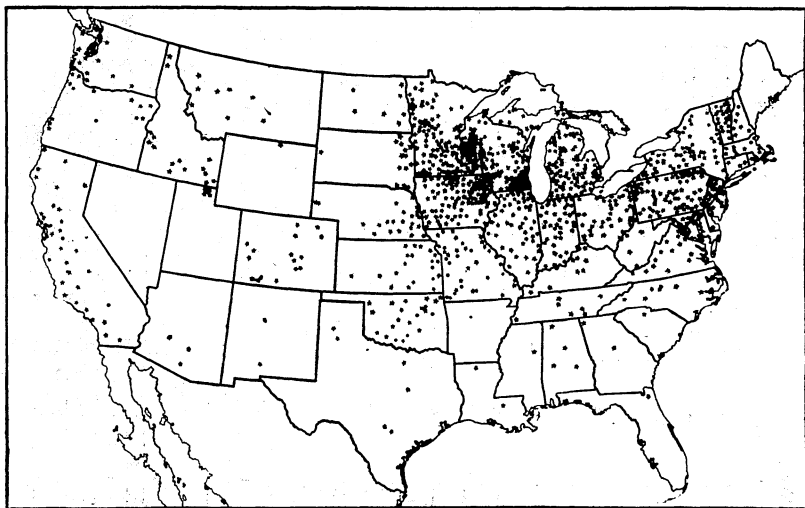


FIGURE 3.—Location of dairy-herd-improvement associations, January 1, 1929

tion to his knowledge of the work. If testing pays, and it most certainly does, the work should be extended until many more than 2 per cent of our dairy cows are placed on yearly test.

RESULTS OF DAIRY-HERD-IMPROVEMENT ASSOCIATIONS

FIVE YEARS OF PROGRESS

In a well-managed dairy-herd-improvement association the gain in average production per cow is quite rapid during the first four or five years of association work. In the case of three typical associations—one in Michigan, one in Ohio, and one in Pennsylvania—the average production of butterfat per cow during the first five years of testing showed a gain each year in each association. For the three associations when averages were combined, the yearly butterfat production per cow was as follows: First year, 237 pounds; second year, 255 pounds; third year, 278 pounds; fourth year, 292 pounds; and fifth year, 305 pounds.

What the average butterfat production was during the year before the work began there is no means of knowing, but in many of the herds it probably was about the average production for all the dairy cows in the United States, which is estimated to be 180 pounds a year. Therefore it seems reasonable to conclude that the dairy-herd-improvement association work has added about 125 pounds to the average production of butterfat per cow in these three associations. The figures just given are normal for the well-managed association, but there are many associations where the gains from year to year are not so great.

Every association member should watch the production figures of his cows, and he should not be satisfied unless there is a rapid gain in average milk and butterfat production every year until the herd



FIGURE 4.—Scrub herd. This herd is unprofitable—and does the owner know why?

reaches a high level of production. Even then he should strive to obtain at least a small gain in production per cow from year to year.

HELPS BOTH HIGH AND LOW PRODUCING HERDS

The dairy-herd-improvement association work helps both low and high producing herds. (Figs. 4 and 5.) When the first Minnesota association was started near Albert Lea in 1910 the lowest-producing herd on test consisted of 30 cows whose average production was 2,958 pounds of milk and 112 pounds of butterfat. That year the butterfat did not pay the cost of feed. Four years later there were 20 cows in the same herd; their average production was 4,759 pounds of milk and 228 pounds of butterfat, and the average income over cost of feed was \$50. In four years' time the average butterfat production per cow in that herd was more than doubled, resulting in a substantial income over cost of feed.

The first year the highest-producing herd in that association consisted of 22 cows whose average production was 9,390 pounds of milk and 311 pounds of butterfat, and the average income over cost of feed was \$52. Four years later the same herd consisted of 25 cows whose average production was 11,948 pounds of milk and 400 pounds of butterfat, and the average income over cost of feed was \$98. Here is a gain in yearly production of butterfat per cow of more than 28 per cent, and the income over cost of feed was almost doubled.

These figures show that the work of the dairy-herd-improvement association improves high-producing herds as well as those of lower quality. In both cases the results were brought about through selection and breeding, better feeding, and better care.



FIGURE 5.—A high-producing group. But testing will show big differences in their records

SELLING COWS ON THEIR RECORDS

Reliable production records help in the sale of good stock. Buyers usually want to know how much milk a cow gives. The dairy-herd-improvement association records not only tell this, but they show her butterfat production and the amount of feed she ate while making the record. Anyone would pay more for an animal whose yearly production record shows 10,000 pounds of milk containing 450 pounds of butterfat than if nothing definite were known about her.

At public sales dairy-herd-improvement association records have sometimes greatly raised the prices received for cows. Association sales may be arranged in some cases to advantage. When a sale can be arranged among a number of neighboring farmers it is possible to attract more buyers and thus obtain for the cattle a price nearer their actual value. Such a sale has an advantage to the buyer also, because he knows where to find the stock that is for sale and does not have to spend time and money driving from farm to farm looking for it.

HOW FARMERS REGARD THE WORK

One farmer says that at the beginning of his first year in a dairy-herd-improvement association he knew he was making no money, but he did not know why. He says that at the end of the testing year he still knew he was making no money, but by that time he knew why. He is now the owner of a high-producing and profitable dairy herd.

When another farmer joined a dairy-herd-improvement association he was the owner of 14 cows. The first year's records showed that 7 of his cows were very profitable and that 7 were decidedly unprofitable. This farmer says that his herd reminded him of the Hebrew-Egyptian story of the 7 fat years and the 7 lean years, for as the 7 lean years ate up the 7 fat years, so his 7 poor



FIGURE 6.—Their records tell a pleasing story

cows ate up the profits the 7 good cows made. When that farmer signed up for a second year in the association he was the owner of a smaller but better herd.

The following quotations are from what farmers have said regarding dairy-herd-improvement association work:

The first year I belonged to the association my herd of 10 cows produced an average of 279 pounds of butterfat, with an average income over cost of feed of \$37. The fifth year my herd, which then consisted of 17 cows, produced an average of 380 pounds of butterfat with an average income over cost of feed of \$82.

The work of the dairy-herd-improvement association has increased the cream checks about \$250 a year on my 12 cows.

It is the best-paying investment I ever made.

By doing away with guesswork one can triple his profits and lessen his labor.

The association culls the boarder cows and advertises the good ones.

I found that my best cows were producing butterfat at a third the cost of the poorest one.

I offered to sell a cow for \$75 before testing. She made 495 pounds of butterfat. I would not sell her now.

The dairy-herd-improvement association has added at least \$25 a head to all the cattle I have sold.

The association has greatly improved the social life of the community.

What a change since the association was organized. Now we cooperate in buying feed, in hauling cream, and in holding public sales of tested cows. Every member grows alfalfa, keeps a purebred dairy sire, and raises the best of the heifer calves.

A VIRGINIA EXPERIENCE

A Virginia farmer, the owner of 91 cows, joined a dairy-herd-improvement association. During the first year he discovered that many of these cows were naturally very low producers. To make matters worse, careless feeders dished up the grain with a scoop

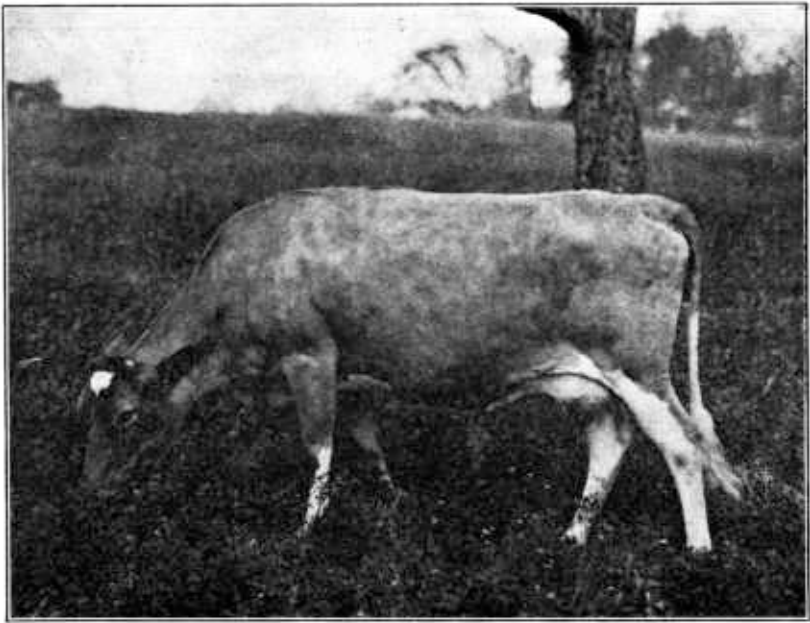


FIGURE 7.—She foraged on the very best of pastures

shovel and fed all the cows alike regardless of production. As might be expected under those circumstances, production was low, feed cost was high, and income was low.

Seven years after this farmer joined the association the herd had been reduced from 91 cows to 54 high-producing cows. Milk production had advanced from 3,311 pounds per cow to 5,953 pounds. Butterfat production had advanced from 155 pounds per cow to 280 pounds. But, most marvelous of all, the income over cost of feed had jumped from 64 cents to \$146.07 per cow per year—more than two hundred times as much. This increase in income over feed cost was due to better cows, better feeding, and to better marketing of the product.

At the end of the seventh year one average cow in the herd produced more income over cost of feed than was produced by the 91

cows. In fact it would require 228 cows like those in the original herd to produce as much income over cost of feed as was produced by one average cow in the later herd. Needless to say, the owner is a firm believer in the work of the well-managed dairy-herd-improvement association. (Fig. 6.)

HOW MOLLY'S LIFE WAS SAVED

A grade Guernsey cow named Molly lived on a beautiful dairy farm near the city of Baltimore. She drank pure fresh water from a sparkling upland stream, and all summer she foraged on the very best of pastures. (Fig. 7.) She did not know that her owner was ignorant of the quality of the milk she gave, nor that he thought the quantity rather small. She did not know that he had telephoned to a cattle dealer, telling him to come and get a certain cow named Molly. (Fig. 8.)



FIGURE 8.—Her owner telephoned to a cattle dealer

The dealer agreed but delayed his coming. About that time the county agent and the dairy extension field man induced Molly's owner to join a dairy-herd-improvement association (fig. 9), and one day the tester weighed and tested Molly's milk (fig. 10).



FIGURE 9.—Her owner joined a dairy-herd-improvement association

The test showed 5.5 per cent butterfat, and the tester advised that Molly be kept a little longer, because her milk more than made up in quality for what it lacked in quantity.

Before that testing year had run its course Molly had proved herself a high tester and persistent milker. Her daily yield was never large, but the total for the year was 5,967 pounds of milk, containing 330 pounds of butterfat. In production of butterfat Molly ranked among the highest in the herd. Her records saved her life.

WHAT DAIRY-HERD-IMPROVEMENT ASSOCIATION RECORDS REVEAL

BETTER COWS NEEDED

In many sections of this country we have enough cows but not good enough cows. Our slogan should not be "More cows" but "More good cows." Here is one place where there is an abundance of room at the top.

In the Newaygo County, Mich., association the herd that one year had the highest average production of butterfat per cow consisted of

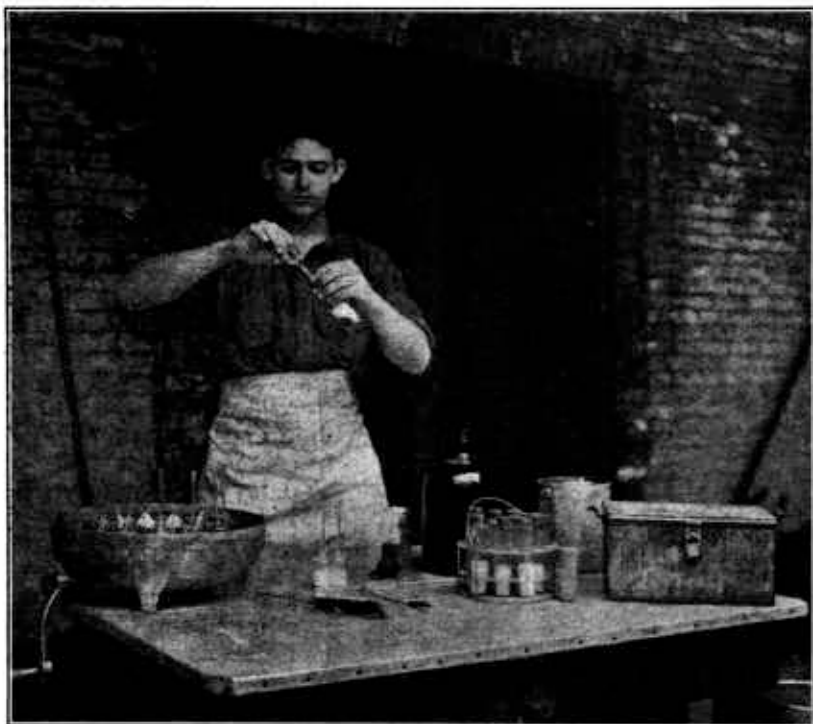


FIGURE 10.—Testing Molly's milk

10 cows and the herd that had the lowest average production consisted of 20 cows. The herd of 10 cows had a total income over cost of feed of \$666, and the herd of 20 cows, \$455. The owner of the larger herd needed 9 more cows of the kind he was keeping to get as much income over cost of feed as was produced by the smaller herd.

It is better, however, to own 10 good cows than 29 poor ones. It demands less labor and other costs. To build up a herd of 10 good cows (fig. 11) requires much headwork. To take care of a herd of 29 poor cows requires much handwork. The dairyman who does not use his head must work that much harder with his hands.

FEEDING FOR PROFIT

A tabulation of more than 100,000 yearly records of association cows has shown that on an average the high producers of milk and butterfat consumed more dollars' worth of feed per cow than the low producers, but they also yielded a higher income over cost of feed. Evidently it pays to feed good cows well.

The dairy cow may be considered as a feed market. The low-producing cow pays a low price for feed and the high-producing cow pays a high price for feed. A tabulation of more than 100,000 yearly individual-cow records showed an average return of \$2.36 for every dollar spent for feed. The returns varied from less than \$1 to a little more than \$3. The cow that returns a dollar for a dollar's worth of feed is a very poor feed market, but the cow that returns \$3 for \$1 worth of feed is a very good feed market. The dairy-herd-improvement association herd book, completely filled out and posted up to date, is one of the best feed-market reports the dairyman can

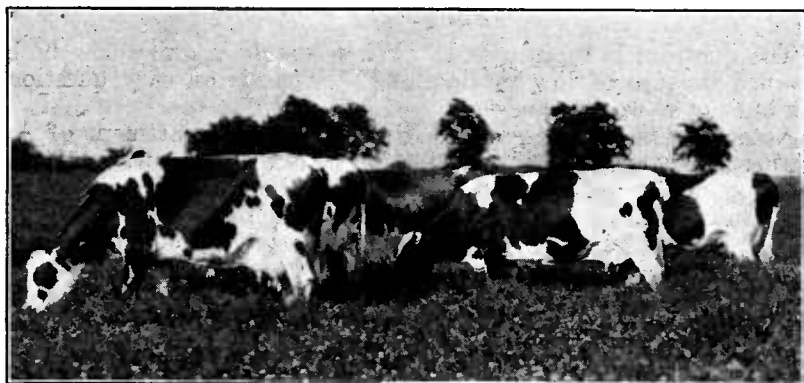


FIGURE 11.—To build up such a herd requires testing, not guesswork

have. It tells him how many dollars' worth of feed Spot, Daisy, and the rest of his cows are eating, also how much each cow is paying for her feed.

GOING UP OR COMING DOWN

The dairy-herd-improvement association records show that some herds improve from year to year and that others decline. This was demonstrated in the case of two herds that were on test continuously during the first four years in one association. The results are shown in Table 2.

TABLE 2.—Average butterfat production per cow per year in two herds of the same association

	Herd A	Herd B
First year.....	377	234
Second year.....	350	244
Third year.....	321	302
Fourth year.....	313	315

When the work began herd A excelled herd B in butterfat production by a margin of 143 pounds per cow. In each successive year herd A went down and herd B went up in yield per cow until at the end of the fourth year herd B produced a trifle more butterfat per cow than herd A.

These figures show that membership in an association helps but little unless the lessons are put into practice. The owner of herd A should find out why the average butterfat production in his herd is gradually coming down, and he should find some means to face his herd the other way. The owner of herd B is doing very well. The average production of his herd is going up, because he is weeding out the poor cows and feeding the remaining ones better. He should do his best year by year to push the average still higher. No dairy herd has ever dropped so low that culling, feeding, and breeding could not build it up, and no herd is yet so high that these three factors can not lift it higher. The association records tell the true story and show whether production is going up or down.

A DAIRY DEAD LINE

The question is often asked: "When should a dairy cow be condemned because of low production?" That is an easy question to ask but not so easy to answer.

According to estimates of the United States Department of Agriculture, the average yearly production of our dairy cows in 1927 was 4,600 pounds of milk and 180 pounds of butterfat. Certainly no one will contend that a mature cow whose production is below that level should long be kept on a dairy farm. A tabulation of more than 140,000 yearly records of dairy-herd-improvement association cows has shown an average yearly production of 7,410 pounds of milk and 293 pounds of butterfat per cow. Many dairymen feel that a level of 6,000 pounds of milk and 240 pounds of butterfat per cow per year should be required of every mature cow in the herd. Some have fixed an even higher standard.

Many a good cow has lost her life because her owner did not know what she produced. Many a good cow's life is still in danger because her owner does not keep production and feed-cost records of his cows. It is easy to place the dead line at 6,000 pounds of milk and 240 pounds of butterfat a year, but it is not so easy to bring the record of every mature cow above that line. Culling alone will not do it without too much killing. Culling and feeding, together, will not do it without too much killing and too much cost. But culling, feeding, and breeding, all combined, will do it, and do it at a cost that ordinarily will leave a fair net profit.

DRY TOO MUCH OF THE TIME

In a Mississippi association, during the testing year 1921-22, one cow produced milk 7 months, made a butterfat production of 79 pounds, and an income of \$7 over cost of feed. Another cow produced milk 11 months, made a butterfat record of 313 pounds, and an income over cost of feed of \$64. In dollars' worth of feed the higher producer ate more than twice as much as the other cow, but she produced four times as much butterfat and nine times as much income over cost of feed. The good cow was a persistent high pro-

ducer; the other was a very low producer. Even during the period when she was fresh she was a low producer, and she was dry too long.

A tabulation of more than 10,000 yearly individual-cow records from dairy-herd-improvement associations showed that on an average those cows remained in the herd 4.7 years from the time they reached production age. Similar studies of records by the Bureau of Agricultural Economics of the United States Department of Agriculture,² and by C. W. Larson³ gave 4.43 years and 4.85 years, respectively. Figures from these and other sources indicate that on an average dairy cows remain in the herd less than 5 years from the time they reach production age. If that is true, the average dairy cow has already lived about one-third of her life before she directly pays a single dollar for her stable room and board. In other words, she lives $2\frac{1}{2}$ years out of $7\frac{1}{2}$ before she produces any milk. If during her 5 productive years she is dry 3 months in every 12, she is dry $1\frac{1}{4}$ years of the 5. Two and one-half years plus one and one-fourth years equal three and three-fourths years of nonproduction, exactly one-half of the entire lifetime of the cow.



FIGURE 12.—Her record is as persistent as the summer's sun

If our dairy cows freshened once a year on an average, which at present they do not, and if each were a persistent high producer, their productive lifetime in the herd might be 10 years instead of 5 and their income over cost of feed during all the years would be several times what it is now.

A low-producing dairy cow, if she yields a profit at all, may not yield one until she is 6 or 7 years old and she may cease to be profitable while still comparatively young.

A high-producing dairy cow begins to yield a profit at the age of 2 or 3 years. When she is 6 or 7 years of age her profits are very high, and she may continue to yield a profit until very late in life. (Fig. 12.)

The lifetime records of a low-producing cow may be likened to the daily course of the winter's sun, which rises late, remains low, lasts only a little while, then disappears. The lifetime record of a

² SPILLMAN, W. J., DIXON, H. M., and BILLINGS, G. A. FARM MANAGEMENT PRACTICE OF CHESTER COUNTY, PA. U. S. Dept. Agr. Bul. 341, 99 p., illus. 1916.

³ LARSON, C. W. MILK PRODUCTION COST ACCOUNTS, PRINCIPLES, AND METHODS. 60 p. New York. 1916.

high-producing cow may be likened to the daily course of the summer's sun, which rises early, climbs to a great height, remains long, descends slowly, and seems reluctant to disappear.

WHEN COWS SHOULD FRESHEN

A tabulation of more than 10,000 yearly records of association cows showed that those cows which freshened in the fall and early winter did better in production of milk and butterfat and in income over cost of feed than those which freshened in the spring and summer. Those that freshened in the fall and winter produced 11 per cent more milk, 11 per cent more butterfat, and 11 per cent more income over cost of feed than those that freshened in the spring and summer.

While fall and winter freshening won on an average, they did not win on every farm nor in every association. The influence of date



FIGURE 13.—Following in the footsteps of her mother

of freshening appears to be a local problem for which no general rule can be given.

VALUE OF THE HERD BULL

As a part of dairy-herd-improvement association work, more than 500 bulls have been proved by comparing the yearly production records of all the daughters (five or more) of each bull with the yearly production records of the dams of the daughters. Altogether the records of 3,257 daughters have been compared with those of their dams. On an average the dams produced 9,055 pounds of milk per year and the daughters 9,536 pounds. The dams averaged 346 pounds of butterfat a year and the daughters 387 pounds. The daughters, therefore, produced 5.3 per cent more milk and 11.8 per cent more butterfat than their dams. (Fig. 13.)

The figures showed that about one-third of the bulls lowered the production of the herds in which they were used, that about one-third brought small gains, and that one-third brought big gains. The dairy-herd-improvement association records, if studied carefully, will show which bulls are improving the herds in which they are being used. These records test the sires as thoroughly as they test the cows. The cow is tested through her own record; the bull is tested through the records of his daughters.

HOW TO START AND CONDUCT AN ASSOCIATION

STARTING THE ORGANIZATION

After a community has become convinced of the need of having a dairy-herd-improvement association, the next step is to organize. A meeting may be called and a temporary organization effected. The neighborhood is thoroughly canvassed until about 26 dairymen have agreed to become members. Another meeting is then called and a permanent organization formed. Officers are elected and a constitution and by-laws adopted.

The best experience shows that this work should be done under the direction of the dairy extension specialist and the county agent, and with the full cooperation of all local agencies.

In this bulletin is a draft of constitution and by-laws. These indicate a form of organization that will give satisfaction and meet the needs of most associations. Whatever adaptations are necessary to fit them to local needs and desires can readily be made.

The county agent, the State agricultural college, or the Bureau of Dairy Industry of the United States Department of Agriculture, will on application furnish copies of the constitution and by-laws, membership agreements, and also copies of the form to be used in making a contract between the association and the tester.

COST

Enough money must be raised each year to pay the tester's salary, which is usually somewhere between \$75 and \$100 per month, and to provide for the incidental expenses connected with the work. The testing outfit, costing about \$50, must be purchased the first year. An additional \$50 should pay for the sulphuric acid, breakage, record blanks, publicity, and all other incidental expenses necessary for the work for a year. The entire cost, including the board of the tester and his transportation from farm to farm, is not high for each member of the association. Generally the cost is distributed so that the owners of large herds pay more than the owners of small herds.

TESTING OUTFIT

The testing outfit consists of the following: Milk scales, Babcock tester and glassware, sample jars, sample dipper, test-bottle bath, drainage rack, supply of commercial sulphuric acid (specific gravity of 1.83), a set of computing tables, a suitable box with lock to hold the apparatus and to keep milk samples until they are tested.

SELECTING A TESTER

As a rule the members of the association must rely largely on the State agricultural college when it comes to the selection of a competent tester.

The tester should have some special training in testing in addition to farm experience. The more he actually knows about selection, feeding, and constructive breeding of dairy cattle, the greater will be the value of his services to the association. It is essential that

he be a man of good habits, and neat and clean in every way. He must be the type of man that will be welcome in the homes of the community, because it is in these homes that he must live while working there.

The farmers, however, must not expect too much of the cow tester. He is there primarily to weigh and test the milk, to weigh the feed, and to keep complete and accurate records of the work. He may also advise the members of the association regarding the feed and care of each cow in the herd. He can not work miracles. He can not by any method of feeding get a yearly butterfat production of 300 pounds from the cow with ability to produce only 100 pounds.

WORKING WITH THE TESTER

The tester can be of great service if all the members of the association will work with him toward the building up of better herds of dairy cattle. The wide-awake tester is a willing worker. He begins his day in the early morning and continues until the milking is done at night and the samples are all put away under lock and key. He weighs the feed, weighs and tests the milk, and keeps the records constantly up to date. He is ready at all times to interpret the figures to the best of his ability and to work out with the farmers better methods of feeding, care, and management. To do all this and do it well, he must have the cooperation of the farmers in the association.

THE TESTER'S WORK

The tester visits each farm one day each month. Usually he arrives in the afternoon. That evening he weighs the feed, weighs the milk, and takes a sample of the milk for testing. He records all figures in the barn book, from which he transfers them to the herd book. The barn book is the tester's record of the work, and the herd book remains in the possession of the farmer as his record of the work. The next morning the tester again weighs the feed, weighs the milk, and takes a sample of the milk for testing. He thoroughly mixes the two samples of each cow's milk, and then tests the composite sample for percentage of butterfat.

From the herd book the farmer can at any time get the record of his herd and of each cow for every month from the beginning of the testing year. He can also get totals for each cow. The herd records include feed cost and production of milk and butterfat. The individual-cow records include all this and the number of pounds of each kind of feed consumed.

At the end of the testing year the farmer can get from the herd book the yearly summary of his herd and of each cow. As the years pass he can compare the yearly records and determine what progress his herd is making and what progress each cow is making. If the herd books are carefully and completely filled out, the farmer can get all this information very quickly and from this knowledge of the records of his cows he can go forward, without guesswork, in the improvement of his herd. With a well-kept herd book the farmer is able to build up his herd quickly through intelligent selection, breeding, and feeding.

HOW TO OBTAIN COMPLETE RECORDS

The question is sometimes asked: How can testers be induced to fill out the records accurately and completely at the end of the testing year? It has been found in practice that it is not advisable to hold back part of the tester's salary until he turns in his records properly filled out, as that is a penalty which antagonizes the tester and results in hard feelings to no purpose. A better way is to offer the tester a bonus to be paid when he does fill out the records in proper form. He will work harder to obtain a bonus than to avoid a penalty. With the offer of a substantial bonus for the satisfactory completion of the year's work by the tester, it is believed that every tester will be induced to turn over to the State records of the highest value, and that by so doing each tester will better serve the interests of the farmers who belong to the local association.

MILKING AT REGULAR TIMES

Many farmers weigh the milk of each cow at every milking. This enables them to detect any gain or falling off in milk flow and to feed according to milk production. By the use of the milk scales, if the milking is done at the same time every day, the dairyman can readily determine which of his cows are responding to better feed and care. It is especially important that the milking should be at regular times on the day the tester is there and the day before he comes, because the total production for the monthly testing period is usually calculated entirely from the records made the day the tester is on the ground. There should be no temptation on the part of the farmer to inflate the records through irregular milking periods, because the primary purpose of dairy-herd-improvement association work is to let the farmer himself know the true production and feed-cost records of his cows. Knowing these records he can select, breed, and feed intelligently.

COMMUNITY DEVELOPMENT

One of the most valuable advantages of organized cow testing is the development of the community. The farmers of some associations get together once a month to discuss the business of the association and to exchange ideas regarding better methods of dairying. Sometimes these meetings take the form of an automobile tour, a summer picnic, or a field day, and a definite program is carried out.

Make the program entertaining and inspirational as well as educational. It should be made so interesting and valuable that all who come this year will want to come next year. In discussing association records, herds should be referred to by number rather than by name.

Placing some of the best cows on exhibition will add interest to the meeting. A judging demonstration or judging contest will generally appeal to most of the people present. An automobile trip to some of the best dairy farms of the community has been tried out and has proved to be valuable and profitable. This trip enables the farmers to see the best cows belonging to members of the association and to observe the methods of the best farmers in the community.

PRODUCTION AND INCOME

HOW THE INCOME CLIMBS

High-producing dairy cows are profitable cows. In a tabulation of more than 100,000 yearly records of cows in dairy-herd-improvement associations, where the income was from the sale of butterfat, the group of cows having an average yearly butterfat production of 100 pounds made an average income of \$14 over cost of feed. At 200 pounds of butterfat a year the income over cost of feed was \$54; at 300 pounds it was \$96; and at 400 pounds it was \$138. This does not mean that every cow that produces 400 pounds of butterfat a year will bring in an income over cost of feed of \$138, but it does mean that this is the relative advantage and that under normal conditions such a cow is many times more profitable than the one that produces only 100 pounds of butterfat.

This study covers the period 1925 and 1926, and includes records from various parts of the United States. The feed cost and income figures vary for different years and for different geographical districts. For example, in most of the leading dairy districts, a cow that produces 100 pounds of butterfat a year does not ordinarily yield an income over cost of feed; yet in some of the less-developed districts where feeds are cheaper such cows may return a small income above feed cost.

On an average, 1 cow in the 400-pound group produced approximately the same income over cost of feed as 11 cows in the 100-pound group. Most dairymen would rather take care of 1 good cow than 11 poor ones, yet in many of our dairy herds the 100-pound cows are much more numerous than the 400-pound cows. It is almost incomprehensible that any dairyman will continue to care for low-producing, unprofitable cows in his herd year after year when there are so many other and more worthy objects of charity.

As average butterfat production per cow increased from group to group, the gain in income over cost of feed was very regular. As a rule, a gain of 50 pounds in production of butterfat per cow was accompanied by an increase of \$20 in income over cost of feed. The figures also showed that very few association cows are fed beyond the point of economical production. The figures invariably showed that the highest-producing group was the most profitable group of dairy cows.

THE COST OF KEEPING SCRUBS

The average yearly butterfat production of all the dairy cows in this country has been estimated at about 180 pounds. Assuming that this is the average production and that half the dairy cows are below average, we bump up against the astounding fact that we are feeding good hay and grain and pasture to about 10,000,000 low-producing dairy cows. It costs about \$500,000,000 to feed these cows and about \$500,000,000 more for labor and for overhead expenses. If the dairy-herd-improvement association eliminates the scrubs and establishes well-fed, well-bred, high-producing cows on every dairy farm it will have accomplished its chief purpose. - Even then, however, its work will not all be done, because these higher standards must be maintained.

POWER IN ACTION

To get anything out of dairy-herd-improvement association work the dairyman must make use of the information obtained from a careful study of the records. If he does this, the records will be a gold mine of useful information to him. From his knowledge of the records of dams and daughters the dairyman can determine definitely what progress his herd is making due to breeding. From his knowledge of production and feed-cost records he can, without guess work, eliminate all cows that do not yield a profit, and he can feed the remainder according to their known production. As the years pass he can eliminate all cows except those that yield large returns; and gradually, but certainly, he can build up a herd of high-producing, profitable dairy cows.

CONSTITUTION AND BY-LAWS FOR THE COOPERATIVE DAIRY-HERD-IMPROVEMENT ASSOCIATION

(As adopted by the dairy-herd-improvement association committee of the American Dairy Science Association)

CONSTITUTION

ARTICLE I.—NAME

The name of this association shall be the ——— Dairy-Herd-Improvement Association.

ARTICLE II.—OBJECT

The object of this association shall be to provide means and methods for improving the dairy herds of members. This will be accomplished through the keeping of production, feed, and income records of each cow, on the basis of which unprofitable cows may be eliminated and feeding done more economically.

ARTICLE III.—PLACE OF BUSINESS

Its principal office and place of business shall be at ———.

ARTICLE IV. MEMBERSHIP

This association shall be composed of dairymen or owners of dairy herds who agree to comply with the members' agreement, and who are acceptable to the board of directors.

ARTICLE V. MEETINGS

This association shall meet annually for the election of a board of directors and for the transaction of other necessary business at such time and place as may be determined upon by the board of directors. All members shall be notified at least one week in advance of such meetings. Special meetings of the association may be called by the president or the board of directors, notices thereof at least two days in advance to be given to all the members of the association. Meetings of the board of directors shall be called by the secretary on the order of the president or three members of the board.

ARTICLE VI. ORGANIZATION

The governing body of this association shall consist of a board of directors composed of five active members, who shall elect from their own number a president, vice president, secretary, and treasurer, whose duties shall be those usually devolving upon such officers. The first election of officers shall be held immediately after the election of the board of directors. All officers and directors shall hold office until their successors are elected. Vacancies occurring in the board of directors shall be filled by a majority vote of the remaining members of the board.

ARTICLE VII. BUSINESS

Authority to conduct the business of the association shall be vested in the board of directors.

ARTICLE VIII. ELECTION

Election of all officers and directors shall be by majority vote.

ARTICLE IX. AMENDMENTS

This constitution may be amended by a two-thirds vote of the active members of the association present at any annual meeting.

BY-LAWS**ARTICLE I. ORDER OF BUSINESS**

1. Reading of minutes of previous meetings.
2. Reports of secretary and treasurer.
3. Reports of committees.
4. Unfinished business.
5. New business.
6. Election of officers.

ARTICLE II. QUORUM

Three members of the board of directors shall constitute a quorum.

ARTICLE III. AMENDMENTS

The by-laws may be amended by a two-thirds vote of the active members of the association present at any annual meeting.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

October 3, 1929

<i>Secretary of Agriculture</i> -----	ARTHUR M. HYDE.
<i>Assistant Secretary</i> -----	R. W. DUNLAP.
<i>Director of Scientific Work</i> -----	A. F. WOODS.
<i>Director of Regulatory Work</i> -----	WALTER G. CAMPBELL.
<i>Director of Extension Work</i> -----	C. W. WARBURTON.
<i>Director of Personnel and Business Administration.</i>	W. W. STOCKBERGER.
<i>Director of Information</i> -----	M. S. EISENHOWER.
<i>Solicitor</i> -----	R. W. WILLIAMS.
<i>Weather Bureau</i> -----	CHARLES F. MARVIN, <i>Chief.</i>
<i>Bureau of Animal Industry</i> -----	JOHN R. MOHLER, <i>Chief.</i>
<i>Bureau of Dairy Industry</i> -----	O. E. REED, <i>Chief.</i>
<i>Bureau of Plant Industry</i> -----	WILLIAM A. TAYLOR, <i>Chief.</i>
<i>Forest Service</i> -----	R. Y. STUART, <i>Chief.</i>
<i>Bureau of Chemistry and Soils</i> -----	H. G. KNIGHT, <i>Chief.</i>
<i>Bureau of Entomology</i> -----	C. L. MARLATT, <i>Chief.</i>
<i>Bureau of Biological Survey</i> -----	PAUL G. REDINGTON, <i>Chief.</i>
<i>Bureau of Public Roads</i> -----	THOMAS H. MACDONALD, <i>Chief.</i>
<i>Bureau of Agricultural Economics</i> -----	NILS A. OLSEN, <i>Chief.</i>
<i>Bureau of Home Economics</i> -----	LOUISE STANLEY, <i>Chief.</i>
<i>Plant Quarantine and Control Administration</i> -----	C. L. MARLATT, <i>Chief.</i>
<i>Grain Futures Administration</i> -----	J. W. T. DUVEL, <i>Chief.</i>
<i>Food, Drug, and Insecticide Administration</i> -----	WALTER G. CAMPBELL, <i>Director of</i> <i>Regulatory Work, in Charge.</i>
<i>Office of Experiment Stations</i> -----	E. W. ALLEN, <i>Chief.</i>
<i>Office of Cooperative Extension Work</i> -----	C. B. SMITH, <i>Chief.</i>
<i>Library</i> -----	CLARIBEL R. BARNETT, <i>Librarian.</i>

This bulletin is a contribution from

<i>Bureau of Dairy Industry</i> -----	O. E. REED, <i>Chief.</i>
<i>Division of Dairy-Herd-Improvement Investigations.</i>	J. C. McDOWELL, <i>Chief.</i>

21